ECS BOM and PCB Design Requirements

To order any electronic parts or PCBs, submit your BOM (bill of materials) or PCB file (we only need the .pcbdoc file) to electronics@ecs.vuw.ac.nz.

Please, submit separate requests to electronics for BOMs and PCBs, please don't combine them into one email as they are dealt with differently.

Please include the course code and the project/lab name in the subject line.

Guidelines for a BOM …

- Text only (no URLs)
- Select your parts from element14, Digi-Key, Mouser, RSComponents, Sparkfun, or Jaycar etc (element14 is preferred)
- If you have found a part via another supplier or you can only find it via a specific supplier, that is ok, just check with electronics as to whether we can order from them

- Preferred suppliers … but we can order from many more

   http://nz.element14.com/
   http://www.digikey.co.nz/
   http://nz.mouser.com/
   http://newzealand.rs-online.com/web/
   http://www.jaycar.co.nz/index.asp
   http://www.sparkfun.com/index
   http://www.seeedstudio.com/depot/
   http://www.pololu.com/
   http://www.robotshop.com/store
   http://www.dfrobot.com/index.php
   http://www.servocity.com/
   http://www.hobbyking.com/hobbyking/store/index.asp
   http://www.amainhobbies.com/
   http://www.parallax.com/

Example BOM

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Supplier    Stk No.    Qty     Description
element14   1577684    5       RESISTOR, 0805, 68K, 0.1%, 0.125W
element14   1636087    5       WURTH ELEKTRONIK 74454010 CHOKE, SMD, 10UH
element14   1299291    5       TAIWAN SEMICONDUCTOR SK54C DIODE, SCHOTTKY, 5A, 40V, SMC
element14   1716771    10      MULTICOMP OVS-0604 LED 0603 SUPER BRT TRUE GRN
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If you have 1 to 5 lines of items to order, submitting as text in an email is ok, if you have eight or more line items, then please submit your BOM as an attached spreadsheet.

What we need, is the quantity, the suppliers stock ref. number, the manufactures part number and the manufacturers description (helps us to double check what is being ordered .. and quickly identify errors, or alternatives)

When composing your requests, think about how the reader (ie us techs) is going to interpret your request, and what you can do to make your request more readable / not confusing. Try to think about the sort of info you would need if you had to order the part.

For example …
    Bad requests …
        "please get me one A131204 from Active Components"

    And …
        "Hi, I need these from phidgets *3325_0 x1* *3531_0 x1*"

    This is better …
        Can you please order the following for me from Active Components
        www.activecomponents.com
        1x   A131204   3-15VDC/12VDC 13.8mm PCB Piezo Buzzer PK-12N40PE-TQ

    Or …
        Can you please order the following for me
        www.phidgets.com
        1x   3325_0   42STH38 NEMA-17 Bipolar Stepper with 5.18:1 Gearbox
        1x   3531_0   Optical Rotary Encoder HKT22

It's a read-ability thing, if you can list what you want in 5 lines (as shown above), then that is ok.

Please don't put multiple orders into one email .. that is to say, please don't send a request for a dozen items from supplier X, and a dozen items from supplier Y all in the same email … as it makes it hard to track what has been supplied to you and what is still outstanding.

Check that your items are in stock. Items from element14, if stocked locally will take approximately two days to arrive (although they say overnight). Some of element14's stock is stocked in the US and the UK. These items take five to seven working days to arrive, so be careful.

Sometimes you actually have to put the items in a "basket" in order to find out if the item is in stock (you don't need an account or to be logged into element14, Mouser, Digi-Key or RSComponents in order to make up a "basket" and it's any easy way to check if things are in stock).

Shipping from RSComponents and element14 is essentially free, and will sometimes arrive the following day (depending on which warehouse is has to come from) .. but we do try to keep our orders to a minimum of $45.

Shipping from Mouser and Digi-Key costs approximately $40 USD, so unless we can make up an order of more than $200 NZD. Items from overseas distributors such as Mouser, Digi-Key, Sparkfun, Pololu, etc usually take about four days to arrive. If we can place the order on a Thursday, the items should arrive on the following Monday.

We can usually combine orders from several people, but don't ask for just a resistor from Mouser or Digi-Key, because the likely chances are, that we won't order it. Have a look to see if it is available from element14 or RS Online, or indicate to us that it is not required urgently, or whether you can wait a couple of weeks for it.

Also, shipping from overseas retailers can incur excessive shipping costs, so requesting a $14 USD accelerometer board from RobotShop.com may take a while to get ordered, as a $14 USD part does not justify the $60 USD shipping cost.

We will always look to ship via a courier company (FedEx, UPS, DHL), as they can guarantee delivery and can provide detailed tracking information on the parcels. Shipping via FedEx, UPS, or DHL will usually take 3 to 4 days to deliver. Shipping via USPS, or EMS can take 7 to 30 days, and only provides minimal tracking information (ie the parcel has left the country of origin … and that is pretty much it).

Please don't order items from eBay, Trademe, Amazon, DealExpress, or AliExpress … although these sources offer temptingly cheap prices, it is a right royal pain from an accounting point of view because they do not produce appropriate invoicing documentation, and we will attempt to avoid purchasing from these suppliers doing so at all costs.

PCB Design Requirements …

PCB design is best done in Altium, because we can easily view the files make adjustments if required, and it is available on the ECS computers. (*We don't use Eagle … it's not that we think Eagle is bad, after all it's free, it's just that we don't use it*)

If you would like us to comment on your design, we will need the .pcbdoc and .pcbsch files only. The easiest this to do, is to zip these files along with the .pcbprj and email them to us. (Don't zip the project directory, as it contains history and output files that are not required, and will make the zipped file too large to email.)

- *ECS Design Requirements*

PCBs made here can be double sided, but will not be PTH (plated through hole) and will not come with a solder mask (the green coating on a PCB) or a silkscreen (the words and component outlines). If your PCB is double sided, you will need to solder a wire into the via to connect the topside track to the bottom side track.

- o   15 mil (0.381 mm) tracks / 15 mil (0.381 mm) spacing
- o   Drill sizes: 0.6 mm to 2.5 mm (in 0.1 mm steps, holes over 2.5mm are routed)
- o   Maximum number of drill sizes: 4 (try to keep the number of different holes sizes to less than 4, this is because the router can only hold a total of 10 milling tools at a time, and stopping halfway to reload different tools can mess things up)
- o   Board outline on the KeepOut layer

Maximum milling area is 275 mm x 205 mm.

- *SeeedStudio Design Requirements*

http://www.seeedstudio.com/service/index.php?r=pcb

PCBs from SeeedStudio are the real deal … they are PTH, with a solder mask (green) and silkscreen (white) and you get 10 boards of you PCB design.

- o   6 mil (0.1524 mm) tracks / 6 mil (0.1524 mm) spacing
- o   Minimum Silkscreen line thickness: 6 mil (0.1524 mm)
- o   Minimum silkscreen text height: 32 mil (0.8128 mm)
- o   Drill sizes: 0.3 to 6.35 mm (in 0.1 mm steps)
- o   Board outline on the TopOverlay layer (silkscreen layer)
  - o   July 2013   Board outline can also be in the keepout layer (.GKO) or in a mechanical layer (.GML)

Keep your board size to somewhere in 50 mm steps, eg. 50x50, or 100x50, or 100x100, or 150x50, or 150x100, etc (maximum board size is 200 mm x 200 mm)

SeeedStudio's design rules are listed on their page ….
http://support.seeedstudio.com/knowledgebase/articles/422482-fusion-pcb-order-submission-guidelines
http://support.seeedstudio.com/knowledgebase/articles/447362-fusion-pcb-specification